Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel International GCSE (9–1)

Friday 9 June 2023

Afternoon (Time: 1 hour 10 minutes)

Paper reference **4SS0/1B**

Science (Single Award)

Biology
PAPER: 1B

You must have:
Calculator, ruler

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Calculators may be used.

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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P 7 2 5 9 0 A 0 1 1 6

Pearson

Answer ALL questions.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

1 Living organisms share a number of characteristics.

(a) State two of the characteristics shared by living organisms.

(2)

1 .....

2 .....

(b) Organisms are classified into different groups based on their features.

(i) Which feature is found in fungi?

(1)

☒ **A** chloroplast

☒ **B** cellulose cell wall

☒ **C** hypha

☒ **D** plasmid

(ii) Which organism is classified as a fungus?

(1)

☒ **A** amoeba

☒ **B** chlorella

☒ **C** mucor

☒ **D** plasmodium

(c) Viruses are not classified as living organisms.

Explain one reason why viruses are not classified as living organisms.

(2)

.....

.....

.....

.....

.....

(Total for Question 1 = 6 marks)

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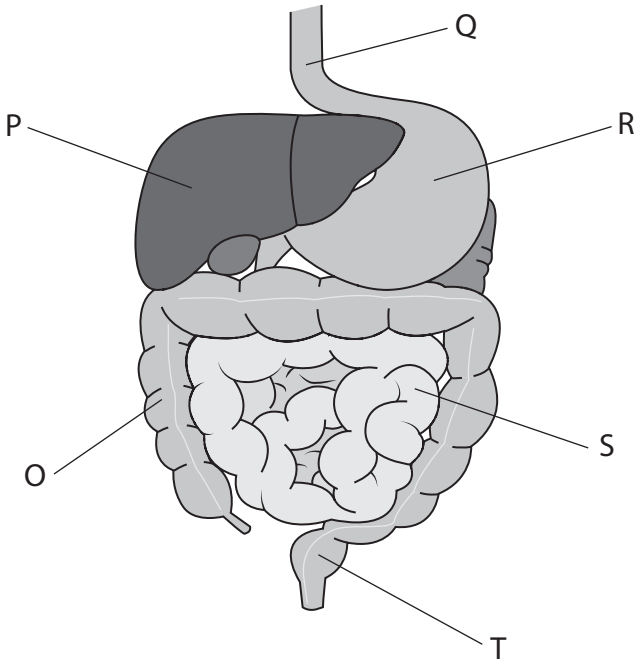
2 The diagram shows part of the human alimentary canal with some structures labelled.



(a) (i) Which structure is part of the large intestine?

(1)

- ☒ **A** O
- ☒ **B** P
- ☒ **C** Q
- ☒ **D** S

(ii) Which structure stores faeces?

(1)

- ☒ **A** P
- ☒ **B** Q
- ☒ **C** R
- ☒ **D** T

(b) Describe the processes that take place in the small intestine.

(4)

(c) A student investigates the composition of four foods, W, X, Y and Z.

He uses four tests to compare the substances present in each food.

The table shows the student's results.

Food	Results of test			
	Iodine test	**Benedict's test**	**Biuret test**	**Ethanol emulsion test**
W	black colour	red colour	purple colour	milky-white colour
X	yellow colour	blue colour	purple colour	stays clear
Y	yellow colour	yellow colour	blue colour	milky-white colour
Z	black colour	green colour	blue colour	stays clear

Use the information in the table to deduce the composition of each food.

(5)

(Total for Question 2 = 11 marks)

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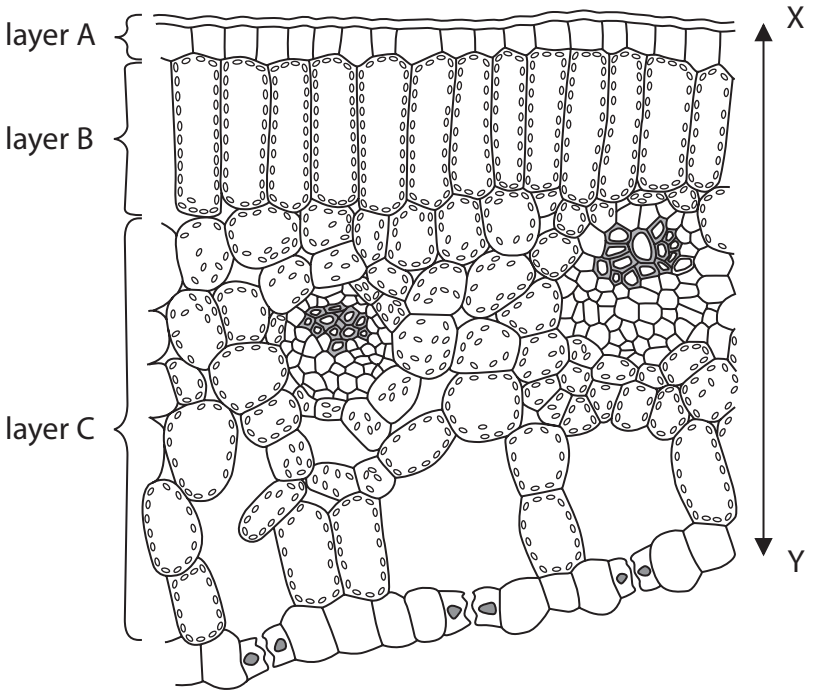
3 The diagram shows a cross-section through a leaf.



(a) The actual thickness of the leaf, from X to Y, is 1100 μm.

[1 mm = 1000 μm]

Determine the magnification of the diagram.

(3)

magnification = ...

(b) Describe the differences between layer B and layer C.

(3)

(c) Explain how layers A and B are adapted for their function.

(5)

A

B

(Total for Question 3 = 11 marks)

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4 Mines are built to extract copper from underground.

Soil containing copper is often left around the entrance to the mines.

Copper is toxic to most plant species, but some plant species are tolerant to copper in the soil.

In an investigation scientists measure the number of two plant species, A and B, at different distances from a mine.

They use these measurements to calculate the mean number of plants of each species in 100 m^2.

The table shows their results.

Distance from mine entrance in m	Mean number of plants in 100 m^2	
	Species A	Species B
less than 0.61	380	18
0.61 to 1.20	110	28
1.21 to 1.80	35	21
1.81 to 2.40	15	12
more than 2.40	6	8

(a) Plot a bar graph to show how the mean number of plants of species A and the mean number of plants of species B changes with distance from the mine entrance.

(5)

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(b) Describe a method that the scientists could use to determine the mean number of plants of species A in 100 m^2.

(3)

(c) Comment on the distribution of the two plant species.

(4)

(Total for Question 4 = 12 marks)

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5 The passage contains information about genetic modification.

Complete the passage by writing a suitable word in each blank space.

(5)

Human insulin is an example of a protein that is manufactured on a large scale using genetically modified bacteria.

Genetic modification involves taking a ..... from one species and inserting it into the DNA of another species.

As this produces an organism containing the DNA from two species, it is called a

..... organism.

Two enzymes are used in this process.

DNA is cut at a specific site using the enzyme called

.....

Then a second enzyme called ..... is used to

..... the pieces of DNA.

(Total for Question 5 = 5 marks)

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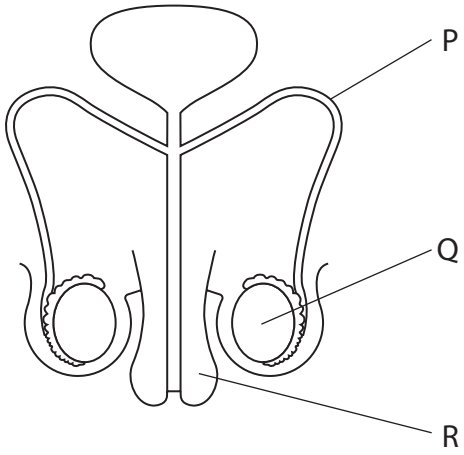
6 (a) The diagram shows the male reproductive system with some structures labelled.



(i) Give the names of structures P and Q.

(2)

P .....

Q .....

(ii) Describe the role of structure R in reproduction.

(2)

.....

.....

.....

.....

.....

.....

.....

(b) The inheritance of sex in rats is the same as in humans.

The sex of a rat is determined by the gametes inherited from the parents.

(i) Use a genetic diagram to show how the sex of the rat offspring is determined.

(3)

(ii) A male rat and a female rat have three offspring.

Calculate the probability that all three of the offspring will be male.

(2)

probability = ...

(Total for Question 6 = 9 marks)

7 Photosynthesis depends on the light available to the leaves of a plant.

Design an investigation to determine the effect of changing the colour of light on the rate of photosynthesis in a water plant.

Include experimental details in your answer and write in full sentences.

(6)

(Total for Question 7 = 6 marks)

TOTAL FOR PAPER = 60 MARKS